WHAT IS CLAIMED IS:

1. A method of equalizing a signal, wherein the signal comprises a series of input blocks of coded data, the method comprising at least the following steps:

a) shifting data in each input block of data to the left;

b) complex multiplying each of the left shifted input block of data by a first set of equalizer coefficients to provide respective first adjusted output blocks of data, wherein step b) is not a full solution to ghosts;

c) complex multiplying each of the input blocks of data by a second set of equalizer coefficients to provide respective second adjusted output blocks of data, wherein step c) is not a full solution to ghosts;

d) shifting the data in each input block of data to the right;

e) complex multiplying each of the right shifted input block of data by a third set of equalizer coefficients to provide respective third adjusted output blocks of data, wherein step e) is not a full solution to ghosts;

f) adding corresponding ones of the first, second, and third adjusted output blocks of data; and,

g) controlling the first, second, and third sets of equalizer coefficients so that, as a result of the addition performed according to step f), a substantially full solution to ghosts is obtained.

2. The method of claim 1 wherein step g) comprises the following steps:

estimating the channel; and,

controlling the first, second, and third sets of equalizer coefficients based upon the estimated channel.

3. The method of claim 1 wherein step g) comprises the step of controlling the first, second, and third sets of equalizer coefficients based upon the addition of step f).

4. The method of claim 1 wherein step g) comprises the following steps:

g1) performing a comparison based upon the addition of step f) and the input blocks of data; and,

g2) controlling the first, second, and third sets of equalizer coefficients based upon the comparison performed in step g1).

5. The method of claim 1 wherein step g) comprises the following steps:

g1) comparing results of the addition of step f) to a reference to form an error;

g2) conjugating the input blocks of data;

g3) shifting data in the conjugated input blocks of data to the left;

g4) shifting the data in the conjugated input blocks of data to the right;

g5) correlating the left shifted, conjugated input blocks of data and the error;

g6) correlating the conjugated input blocks of data and the error;

g7) correlating the right shifted, conjugated input blocks of data and the error;

g8) controlling the first set of equalizer coefficients based upon the correlation performed at step g5);

g9) controlling the second set of equalizer coefficients based upon the correlation performed at step g6); and,

g10) controlling the third set of equalizer coefficients based upon the correlation performed at step g7).

6. The method of claim 5 wherein step g5) comprises the step of down sampling the left shifted, conjugated input blocks of data, wherein step g6) comprises the step of down sampling the conjugated input blocks of data, and wherein step g7) comprises the step of down sampling the right shifted, conjugated input blocks of data.

7. The method of claim 5 wherein the reference is a training signal.

8. The method of claim 5 wherein the reference is sliced data.

9. The method of claim 1 wherein step g) comprises the following steps:

g1) comparing results of the addition of step f) to a reference to form an error;

g2) performing a left shift based upon the input blocks of data;

g3) performing a right shift based upon the input blocks of data;

g4) performing a first correlation based upon results from step g2) and the error;

g5) performing a second correlation based upon the input blocks of data and the error;

g6) performing a third correlation based upon results from step g3) and the error;

g7) controlling the first set of equalizer coefficients based upon the first correlation;

g8) controlling the second set of equalizer coefficients based upon the second correlation; and,

g9) controlling the third set of equalizer coefficients based upon the third correlation.

10. The method of claim 11 wherein the reference is a training signal.

11. The method of claim 11 wherein the reference is sliced data.

12. The method of claim 1 wherein step g) comprises the following steps:

g1) conjugating the input blocks of data;

g2) shifting data in the conjugated input blocks of data to the left;

g3) shifting the data in the conjugated input blocks of data to the right;

g4) performing a first correlation based upon the left shifted, conjugated input blocks of data and the addition of step f);

g5) performing a second correlation based upon the conjugated input blocks of data and the addition of step f);

g6) performing a third correlation based upon the right shifted, conjugated input blocks of data and the addition of step f);

g7) controlling the first set of equalizer coefficients based upon the first correlation;

g8) controlling the second set of equalizer coefficients based upon the second correlation; and,

g9) controlling the third set of equalizer coefficients based upon the third correlation.

13. The method of claim 1 wherein step g) comprises the following steps:

g1) performing a left shift based upon the input blocks of data;

g2) performing a right shift based upon the input blocks of data;

g3) performing a first correlation based upon results from step g1) and the first, second, and third adjusted output blocks of data;

g4) performing a second correlation based upon the input blocks of data and the first, second, and third adjusted output blocks of data;

g5) performing a third correlation based upon results from step g2) and the first, second, and third adjusted output blocks of data;

g6) controlling the first set of equalizer coefficients based upon the first correlation;

g7) controlling the second set of equalizer coefficients based upon the second correlation; and,

g8) controlling the third set of equalizer coefficients based upon the third correlation.

14. The method of claim 1 further comprising the step of h) applying pre-processing coefficients to each data block prior to steps a), c), and d).

15. The method of claim 14 wherein step g) comprises the step of controlling a width of the pre-processing coefficients so that the width of the pre-processing coefficients is substantially commensurate with a width of a data block and an interval between a data block and a ghost.

16. The method of claim 14 wherein step g) comprises the following steps:

estimating the channel; and,

controlling the first, second, and third sets of equalizer coefficients based upon the estimated channel.

17. The method of claim 14 wherein step g) comprises the step of controlling the first, second, and third sets of equalizer coefficients based upon the addition of step f).

18. The method of claim 14 wherein step g) comprises the following steps:

g1) performing a comparison based upon the addition of step f) and the input blocks of data; and,

g2) controlling the first, second, and third sets of equalizer coefficients based upon the comparison performed in step g1).

19. The method of claim 14 wherein step g) comprises the following steps:

g1) comparing results of the addition of step f) to a reference to form an error;

g2) conjugating the input blocks of data;

g3) performing a correlation based upon the error and the conjugated input blocks of data; and,

g4) controlling the first, second, and third sets of equalizer coefficients based upon the correlation.

20. The method of claim 19 wherein the reference is a training signal.

21. The method of claim 19 wherein the reference is sliced data.

22. The method of claim 14 wherein step g) comprises the following steps:

g1) comparing results of the addition of step f) to a reference to form an error;

g2) conjugating the input blocks of data;

g3) shifting data in the conjugated input blocks of data to the left;

g4) shifting the data in the conjugated input blocks of data to the right;

g5) correlating the left shifted, conjugated input blocks of data and the error;

g6) correlating the conjugated input blocks of data and the error;

g7) correlating the right shifted, conjugated input blocks of data and the error;

g8) controlling the first set of equalizer coefficients based upon the correlation performed at step g5);

g9) controlling the second set of equalizer coefficients based upon the correlation performed at step g6); and,

g10) controlling the third set of equalizer coefficients based upon the correlation performed at step g7).

23. The method of claim 22 wherein step g5) comprises the step of down sampling the left shifted, conjugated input blocks of data, wherein step g6) comprises the step of down sampling the conjugated input blocks of data, and wherein step g7) comprises the step of down sampling the right shifted, conjugated input blocks of data.

24. The method of claim 22 wherein the reference is a training signal.

25. The method of claim 22 wherein the reference is sliced data.

26. The method of claim 14 wherein step g) comprises the following steps:

g1) comparing results of the addition of step f) to reference data to form an error;

g2) performing a left shift based upon the input blocks of data;

g3) performing a right shift based upon the input blocks of data;

g4) performing a first correlation based upon results from step g2) and the error;

g5) performing a second correlation based upon the input blocks of data and the error;

g6) performing a third correlation based upon results from step g3) and the error;

g7) controlling the first set of equalizer coefficients based upon the first correlation;

g8) controlling the second set of equalizer coefficients based upon the second correlation; and,

g9) controlling the third set of equalizer coefficients based upon the third correlation.

27. The method of claim 26 wherein the reference is a training signal.

28. The method of claim 26 wherein the reference is sliced data.

29. The method of claim 21 wherein step g) comprises the following steps:

g1) conjugating the input blocks of data;

g2) shifting data in the conjugated input blocks of data to the left;

g3) shifting the data in the conjugated input blocks of data to the right;

g4) performing a first correlation based upon the left shifted, conjugated input blocks of data and the addition of step f);

g5) performing a second correlation based upon the conjugated input blocks of data and the addition of step f);

g6) performing a third correlation based upon the right shifted, conjugated input blocks of data and the addition of step f);

g7) controlling the first set of equalizer coefficients based upon the first correlation;

g8) controlling the second set of equalizer coefficients based upon the second correlation; and,

g9) controlling the third set of equalizer coefficients based upon the third correlation.

30. The method of claim 14 wherein step g) comprises the following steps:

g1) performing a left shift based upon the input blocks of data;

g2) performing a right shift based upon the input blocks of data;

g3) performing a first correlation based upon results from step g1) and the first, second, and third adjusted output blocks of data;

g4) performing a second correlation based upon the input blocks of data and the first, second, and third adjusted output blocks of data;

g5) performing a third correlation based upon results from step g2) and the first, second, and third adjusted output blocks of data;

g6) controlling the first set of equalizer coefficients based upon the first correlation;

g7) controlling the second set of equalizer coefficients based upon the second correlation; and,

g8) controlling the third set of equalizer coefficients based upon the third correlation.

31. The method of claim 14 wherein the pre-processing coefficients are curved.

32. The method of claim 14 wherein the pre-processing coefficients are curved substantially according to a function 1/(2 - cos(t)).

33. The method of claim 1 further comprising the step of applying a spectral transformation to each data block prior to steps a), c), and d), wherein the spectral transformation is longer than a data block.

34. An equalizer for processing blocks of data comprising:

n - 1 data shifters, wherein each of the n - 1 data shifters shifts the blocks of data;

n finite filters, wherein one of the n finite filters applies a corresponding set of finite filter coefficients to the blocks of data, wherein each of the other n - 1 finite filters applies a set of finite filter coefficients to a corresponding output of the n - 1 data shifters, wherein ghosts of the blocks of data are not

eliminated as a result of the application of the sets of finite filter coefficients corresponding to the n finite filters, and wherein n > 2;

an adder arranged to add outputs from the n finite filters; and,

a controller arranged to control the sets of finite filter coefficients corresponding to the n finite filters so that the addition performed by the adder substantially eliminates the ghosts.

35. The equalizer of claim 34 wherein the controller comprises a channel estimator that estimates the channel through which the blocks of data are transmitted.

36. The equalizer of claim 34 wherein the controller controls the n sets of finite filter coefficients based upon an output of the adder.

37. The equalizer of claim 34 wherein the controller comprises a comparator that performs a comparison based upon an output of the adder and the blocks of data.

38. The equalizer of claim 34 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

a conjugator arranged to conjugate the blocks of data;

n - 1 data shifters arranged to shift the conjugated blocks of data; and,

n correlators arranged to perform n - 1 correlations of the shifted, conjugated blocks of data and the error and to perform one correlation of the conjugated blocks of data and the error, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

39. The equalizer of claim 38 wherein the controller further comprises n down samplers, wherein n - 1 of the n down samplers are arranged to down sample the shifted, conjugated blocks of data prior upstream of the correlators, and wherein the other down sampler is arranged to down sample the conjugated blocks of data upstream of the correlators.

40. The equalizer of claim 38 wherein the reference is a training signal.

41. The equalizer of claim 38 wherein the reference is sliced data.

42. The equalizer of claim 34 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

n - 1 data shifters arranged to shift the blocks of data; and,

n correlators arranged to perform n - 1 correlations based upon the shifted blocks of data and the error and to perform one correlation based upon the blocks of data and the error, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

43. The equalizer of claim 42 wherein the reference is a training signal.

44. The equalizer of claim 42 wherein the reference is sliced data.

45. The equalizer of claim 34 wherein the controller comprises:

a conjugator arranged to conjugate the blocks of data;

n - 1 data shifters arranged to shift the conjugated blocks of data;

n correlators arranged to perform n - 1 correlations based upon the shifted, conjugated blocks of data and an output of the adder and to perform one correlation based upon the conjugated blocks of data and the output of the adder, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

46. The equalizer of claim 34 wherein the controller comprises:

n - 1 data shifters arranged to shift the blocks of data; and,

n correlators arranged to perform n - 1 correlations based upon the shifted blocks of data and an output of the adder and to perform one correlation based upon the blocks of data and the output of the adder, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

47. The equalizer of claim 34 further comprising a pre-processor that applies pre-processor coefficients to each data block upstream of the n - 1 data shifters and the n finite filters.

48. The equalizer of claim 47 wherein the controller controls a width of the pre-processing coefficients so that the width is substantially coincident with the width of a data block and an interval between a data block and a ghost.

49. The equalizer of claim 47 wherein the pre-processing coefficients are curved.

50. The equalizer of claim 47 wherein the pre-processing coefficients are curved substantially according to a function 1/(2 - cos(t)).

51. The equalizer of claim 47 wherein the controller comprises a channel estimator that estimates the channel through which the blocks of data are transmitted.

52. The equalizer of claim 47 wherein the controller controls the n sets of finite filter coefficients based upon an output of the adder.

53. The equalizer of claim 47 wherein the controller comprises a comparator that performs a comparison based upon an output of the adder and the blocks of data.

54. The equalizer of claim 47 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

a conjugator arranged to conjugate the blocks of data;

n - 1 data shifters arranged to shift the conjugated blocks of data; and,

n correlators arranged to perform n - 1 correlations of the shifted, conjugated blocks of data and the error and to perform one correlation of the conjugated blocks of data and the error, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

55. The equalizer of claim 54 wherein the controller further comprises n down samplers, wherein n - 1 of the n down samplers are arranged to down sample the shifted, conjugated blocks of data prior upstream of the correlators, and wherein the other down sampler is arranged to down sample the conjugated blocks of data upstream of the correlators.

56. The equalizer of claim 54 wherein the reference is a training signal.

57. The equalizer of claim 54 wherein the reference is sliced data.

58. The equalizer of claim 47 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

n - 1 data shifters arranged to shift the blocks of data; and,

n correlators arranged to perform n - 1 correlations based upon the shifted blocks of data and the error and to perform one correlation based upon the blocks of data and the error, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

59. The equalizer of claim 58 wherein the reference is a training signal.

60. The equalizer of claim 58 wherein the reference is sliced data.

61. The equalizer of claim 47 wherein the controller comprises:

a conjugator arranged to conjugate the blocks of data;

n - 1 data shifters arranged to shift the conjugated blocks of data;

n correlators arranged to perform n - 1 correlations based upon the shifted, conjugated blocks of data and an output of the adder and to perform one correlation based upon the conjugated blocks of data and the output of the adder, wherein each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

62. The equalizer of claim 47 wherein the controller comprises:

n - 1 data shifters arranged to shift the blocks of data; and,

n correlators arranged to perform n - 1 correlations based upon the shifted blocks of data and an output of the adder and to perform one correlation based upon the blocks of data and the output of the adder, wherein

each of the n correlators is arranged to control a corresponding set of equalizer coefficients.

63. The equalizer of claim 34 wherein n > 4.

64. The equalizer of claim 34 further comprising a spectral transformation applied to each data block upstream of the n - 1 data shifters and the n finite filters, wherein the spectral transformation is longer than a block of data.

65. An equalizer for processing blocks of data comprising:

a first data shifter, wherein the first data shifter is arranged to shift the data left by two;

a second data shifter, wherein the second data shifter is arranged to shift the data left by one;

a third data shifter, wherein the third data shifter is arranged to shift the data right by one;

a fourth data shifter, wherein the fourth data shifter is arranged to shift the data right by two;

a first finite filter, wherein the first finite filter applies a first set of finite filter coefficients to each of the blocks of data which have been shifted by the first data shifter, wherein ghosts of the blocks of data are not eliminated as a result of the application of the first set of finite filter coefficients;

a second finite filter, wherein the second finite filter applies a second set of finite filter coefficients to each of the blocks of data which have been shifted by the second data shifter, wherein ghosts of the blocks of data are not eliminated as a result of the application of the second set of finite filter coefficients;

a third finite filter, wherein the third finite filter applies a third set of finite filter coefficients to each of the blocks of data, wherein ghosts of the blocks of data are not eliminated as a result of the application of the third set of finite filter coefficients;

a fourth finite filter, wherein the fourth finite filter applies a fourth set of finite filter coefficients to each of the blocks of data which have been shifted by the third data shifter, wherein ghosts of the blocks of data are

not eliminated as a result of the application of the fourth set of finite filter coefficients;

a fifth finite filter, wherein the fifth finite filter applies a fifth set of finite filter coefficients to each of the blocks of data which have been shifted by the fourth data shifter, wherein ghosts of the blocks of data are not eliminated as a result of the application of the fifth set of finite filter coefficients;

an adder arranged to add outputs from the first, second, third, fourth, and fifth finite filters; and,

a controller arranged to control the first, second, third, fourth, and fifth sets of finite filter coefficients so that the addition performed by the adder substantially eliminates the ghosts.

66. The equalizer of claim 65 wherein the controller comprises a channel estimator that estimates the channel through which the blocks of data are transmitted.

67. The equalizer of claim 65 wherein the controller controls the first, second, third, fourth, and fifth sets of finite filter coefficients based upon an output of the adder.

68. The equalizer of claim 65 wherein the controller comprises a comparator that performs a comparison based upon an output of the adder and the blocks of data.

69. The equalizer of claim 65 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

a conjugator arranged to conjugate the blocks of data;

a first data shifter arranged to shift the conjugated blocks of data left by two;

a second data shifter arranged to shift the conjugated blocks of data left by one;

a third data shifter arranged to shift the conjugated blocks of data right by one;

a fourth data shifter arranged to shift the conjugated blocks of data right by two;

a first correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the first data shifter, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the second data shifter, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation of the error and the conjugated blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the third data shifter, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

70. The equalizer of claim 69 wherein the controller further comprises a down sampler upstream of each of the first, second, third, fourth, and fifth correlators, wherein the down samplers are arranged to down sample the conjugated blocks of data.

71. The equalizer of claim 69 wherein the reference is a training signal.

72. The equalizer of claim 69 wherein the reference is sliced data.

73. The equalizer of claim 65 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

a first data shifter arranged to perform a shift left by two based upon the blocks of data;

a second data shifter arranged to perform a shift left by one based upon the blocks of data;

a third data shifter arranged to perform a shift right by one based upon the blocks of data;

a fourth data shifter arranged to perform a shift right by two based upon the blocks of data;

a first correlator arranged to perform a correlation of an output of the first data shifter and the error, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation of an output of the second data shifter and the error, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation based upon the blocks of data and the error, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation of an output of the third data shifter and the

error, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation of an output of the fourth data shifter and the error, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

74. The equalizer of claim 73 wherein the reference is a training signal.

75. The equalizer of claim 73 wherein the reference is sliced data.

76. The equalizer of claim 65 wherein the controller comprises:

a conjugator arranged to conjugate the blocks of data;

a first data shifter arranged to shift the conjugated blocks of data left by two;

a second data shifter arranged to shift the conjugated blocks of data left by one;

a third data shifter arranged to shift the conjugated blocks of data right by one;

a fourth data shifter arranged to shift the conjugated blocks of data right by two;

a first correlator arranged to perform a correlation based upon an output of the adder and the conjugated blocks of data shifted by the first data shifter, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data shifted by the second data shifter, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data shifted by the third data shifter,

wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data shifted by the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

77. The equalizer of claim 65 wherein the controller comprises:

a first data shifter arranged to perform a shift left by two operation based upon the blocks of data;

a second data shifter arranged to perform a shift left by one operation based upon the blocks of data;

a third data shifter arranged to perform a shift right by one operation based upon the blocks of data;

a fourth data shifter arranged to perform a shift right by two operation based upon the blocks of data;

a first correlator arranged to perform a correlation based upon an output of the adder and an output of the first data shifter, wherein the first correlator is

arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation based upon the output of the adder and an output of the second data shifter, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation based upon the output of the adder and the blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation based upon the output of the adder and an output of the third data shifter, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation based upon the output of the adder and an output of the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

78. The equalizer of claim 65 further comprising a pre-processor that applies pre-processor coefficients to each block of data upstream of the first, second, third, and fourth data shifters and upstream of the third finite filter, wherein the controller controls a width of the pre-processing coefficients so that the width is substantially coincident with the width of a block of data and an interval between a block of data and a ghost.

79. The equalizer of claim 78 wherein the controller comprises a channel estimator that estimates the channel through which the blocks of data are transmitted.

80. The equalizer of claim 78 wherein the controller controls the first, second, third, fourth, and fifth sets of finite filter coefficients based upon an output of the adder.

81. The equalizer of claim 78 wherein the controller comprises a comparator that performs a comparison based upon an output of the adder and the blocks of data.

82. The equalizer of claim 78 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

a conjugator arranged to conjugate the blocks of data;

a first data shifter arranged to shift the conjugated blocks of data left by two;

a second data shifter arranged to shift the conjugated blocks of data left by one;

a third data shifter arranged to shift the conjugated blocks of data right by one;

a fourth data shifter arranged to shift the conjugated blocks of data right by two;

a first correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the first data shifter, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the second data shifter, wherein the second

correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation of the error and the conjugated blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the third data shifter, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation of the error and the conjugated blocks of data shifted by the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

83. The equalizer of claim 82 wherein the controller further comprises a down sampler upstream of each of the first, second, third, fourth, and fifth correlators, wherein the down samplers are arranged to down sample the conjugated blocks of data prior.

84. The equalizer of claim 82 wherein the reference is a training signal.

85. The equalizer of claim 82 wherein the reference is sliced data.

86. The equalizer of claim 78 wherein the controller comprises:

a comparator arranged to compare an output of the adder to a reference to form an error;

a first data shifter arranged to perform a shift left by two based upon the blocks of data;

a second data shifter arranged to perform a shift left by one based upon the blocks of data;

a third data shifter arranged to perform a shift right by one based upon the blocks of data;

a fourth data shifter arranged to perform a shift right by two based upon the blocks of data;

a first correlator arranged to perform a correlation of the error and an output of the first data

shifter, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation of the error and an output of the second data shifter, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation based upon the error and the blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation of the error and an output of the third data shifter, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation of the error and an output of the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

87. The equalizer of claim 86 wherein the reference is a training signal.

88. The equalizer of claim 86 wherein the reference is sliced data.

89. The equalizer of claim 78 wherein the controller comprises:

a conjugator arranged to conjugate the blocks of data;

a first data shifter arranged to shift the conjugated blocks of data left by two;

a second data shifter arranged to shift the conjugated blocks of data left by one;

a third data shifter arranged to shift the conjugated blocks of data right by one;

a fourth data shifter arranged to shift the conjugated blocks of data right by two;

a first correlator arranged to perform a correlation based upon an output of the adder and the conjugated blocks of data shifted by the first data shifter, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation based upon the output of the adder and the

conjugated blocks of data shifted by the second data shifter, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data shifted by the third data shifter, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation based upon the output of the adder and the conjugated blocks of data shifted by the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

90. The equalizer of claim 78 wherein the controller comprises:

a first data shifter arranged to perform a shift left by two operation based upon the blocks of data;

a second data shifter arranged to perform a shift left by one operation based upon the blocks of data;

a third data shifter arranged to perform a shift right by one operation based upon the blocks of data;

a fourth data shifter arranged to perform a shift right by two operation based upon the blocks of data;

a first correlator arranged to perform a correlation based upon an output of the adder and an output of the first data shifter, wherein the first correlator is arranged to control the first set of finite filter coefficients;

a second correlator arranged to perform a correlation based upon the output of the adder and an output of the second data shifter, wherein the second correlator is arranged to control the second set of finite filter coefficients;

a third correlator arranged to perform a correlation based upon the output of the adder and the

blocks of data, wherein the third correlator is arranged to control the third set of finite filter coefficients;

a fourth correlator arranged to perform a correlation based upon the output of the adder and an output of the third data shifter, wherein the fourth correlator is arranged to control the fourth set of finite filter coefficients; and,

a fifth correlator arranged to perform a correlation based upon the output of the adder and an output of the fourth data shifter, wherein the fifth correlator is arranged to control the fifth set of finite filter coefficients.

91. The equalizer of claim 78 wherein the pre-processing coefficients are curved.

92. The equalizer of claim 78 wherein the pre-processing coefficients are curved substantially according to a function $1/(2 - \cos(t))$.

93. The equalizer of claim 65 further comprising a spectral transformation applied to each data block upstream of the first, second, third, and fourth data shifters and the first, second, third, fourth, and fifth finite filter, wherein the spectral transformation is longer than a block of data.